

REMARKS

Claims 1, 7, 8, and 10 are presently pending in the application.

In the Office Action, the Examiner has again rejected claims 1 and 10 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,776,634 of Ohkuma et al. ("Ohkuma") in view of WO 02/48101 of Date et al. ("Date"), relying on U.S. Patent Application Publication No. 2004/0030158 of Date as an English equivalent. Further, the Examiner has rejected claims 7 and 8 under 35 U.S.C. § 103(a) as obvious over Ohkuma et al. in view of Date and further in view of U.S. Patent Application Publication No. 2004/0137368 of Steinmann ("Steinmann"). Applicants respectfully traverse these rejections and the arguments in support thereof for the reasons set forth previously on the record, which Applicants rely upon in full, and for the additional reasons that follow, and respectfully request reconsideration and withdrawal of the rejections.

Rejection Under § 103(a) Based on Ohkuma in view of Date

Regarding claims 1 and 10, the Examiner maintains that Ohkuma teaches a photosensitive composition containing a radical-polymerizable monomer, a cationic-polymerizable monomer, a radical polymerization initiator and a cationic-polymerization initiator. The cationic initiator may allegedly be represented by formula (I), which the Examiner contends is equivalent to claimed formula (I) when Ar is a phenyl group and X⁻ is a SbF₆⁻ anion. The Examiner argues that it would have been obvious to utilize the claimed compound based on the teachings of Ohkuma. The Examiner acknowledges that Ohkuma does not teach the claimed purity of the cationic polymerization initiator. However, as previously explained on the record, the Examiner takes the position that it would have been obvious for one skilled in the art at the time of the invention to use the sulfonium salts with a purity of 99% obtained in the process of Date as photocationic polymerization initiators in the composition of Ohkuma. Finally, the Examiner takes the position that the limitation "wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent" is interpreted as an intended use and given no patentable weight to the claim. Applicants respectfully traverse this rejection as follows.

Initially, Applicants respectfully submit that the Examiner is performing a piecemeal examination of the present application. The amendment to recite “wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent” was not added by the previous Amendment dated June 22, 2010, to which the present Office Action is responsive. Rather, this phrase was added in an Amendment dated January 6, 2010. In the subsequent Office Action (March 25, 2010), the Examiner cited the tertiary reference of Chiu in support of her position that it would have been obvious to modify the Ohkuma/Date composition to dissolve only one component in a solvent. It was only after Applicants demonstrated that Chiu is not effective prior art against the present application that the Examiner took the unsubstantiated position that this recitation is an intended use. The Examiner should have asserted this position in response to the Amendment dated January 6, 2010 in order to reject each claim on all valid grounds available, not in the present Office Action. Applicants submit that this application has accordingly been subjected to long, drawn out piecemeal examination contrary to the guidelines of M.P.E.P. §§ 707.07(g), and that the present Office Action does not advance the prosecution of this application. Withdrawal of the rejections and a Notice of Allowance are respectfully requested.

Applicants respectfully traverse the Examiner’s interpretation that “wherein the photoinitiator for cationic polymerization is the only component in the composition dissolved or dispersed in a solvent” is an intended use. An “intended use” relates to how the claimed invention *may be or will be used*. The recitation of a solvent for dissolving or dispersing the photoinitiator for cationic polymerization does not relate in any way to how the compound *will be used*, but rather describes the state or property of one component of the presently claimed composition. That is, the photoinitiator for cationic polymerization is dissolved or dispersed in a solvent. Despite the Examiner’s assertion to the contrary in the Interview Summary, claim 1 indeed recites the presence of a solvent in the composition, that is, a solvent for the photoinitiator for cationic polymerization.

According to the MPEP, in order to overcome an intended use rejection, the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Even if,

arguendo, the recitation of the solvent for the photoinitiator for cationic polymerization in the present claim were to be an intended use, such a use would indeed result in a structural difference between the claimed invention and the prior art. The presently claimed invention is a composition containing different components having specific properties. One of the properties of the photoinitiator for cationic polymerization is that it is *dissolved or dispersed in a solvent*. Similarly, a property of each of the remaining three components is that they are *not dissolved or dispersed in a solvent*. As acknowledged by the Examiner, such properties are not taught by the cited prior art, thus representing a clear structural difference between the claimed and prior art compositions.

Finally, the presence of a solvent in a composition that is used for stereolithography has a dramatic effect on the procedure; solvents are known in the art to cause problems in stereolithography. In a typical stereolithographic procedure, an uncured resin layer is formed on a cured resin layer (see attached diagram “1.Coating”). A laser beam then irradiates the uncured resin layer under the control of a computer, and the irradiated part of the uncured resin layer is cured (see attached diagram “2. Laser Drawing”). A stereolithographic object can be produced by repeating steps 1 and 2.

When a solvent is included in a composition for stereolithography, various problems typically occur. Due to the presence of the solvent, a drying process is necessary after forming an uncured resin layer. As shown in the attached diagram “Solvent including Situation 1,” drying produces VOCs, which are not ecologically friendly and which damage optical equipment. Drying also increases building time and makes layer thickness control difficult.

Alternatively, as shown in the attached diagram “Solvent including Situation 2,” if a curing process is performed on an uncured resin containing a solvent *without* performing a drying process, a sponge-like object containing uncured solvent is produced. That is, omitting the drying process leads to a weak and unfilled object. It can thus be clearly seen that the presence of a solvent in a composition for stereolithography is problematic.

In the presently claimed composition, three of the four components are not dissolved or dispersed in a solvent. Because the photoinitiator for cationic polymerization is generally solid, this component is dissolved or dispersed in a solvent. However, the amount of solvent included is vanishingly small, and because no other solvent is included in the composition, curing is not

affected by the solvent. Such benefits would not have been expected based on the proposed combination of prior art references.

For at least these reasons, even the proposed combination of Ohkuma and Date would not teach or suggest all of the claimed elements, and reconsideration and withdrawal of the § 103(a) rejection based on Ohkuma in view of Date are respectfully requested.

Rejection Under § 103(a) Based on Ohkuma in view of Date and Steinmann

Regarding claims 7 and 8, the Examiner acknowledges that the proposed combination of Ohkuma and Date does not teach that the composition comprises an oxetane compound and a polyalkylene ether compound as claimed. However, Steinmann allegedly teaches a radiation-curable composition useful for the production of three dimensional articles by stereolithography comprising at least one cationically polymerizing organic substance, at least one free-radical polymerizing organic substance, at least one cationic polymerization initiator, at least one free-radical polymerization initiator, at least one hydroxyl-functional compound, and at least one hydroxyl-functional oxetane compound. Accordingly, the Examiner concludes that it would have been obvious to one having ordinary skill in the art at the time of the invention to add at least one hydroxyl-functional compound, such as propylene glycols of various molecular weights, glycerine propoxylated polyether triol and polyethyleneglycols, and at least one hydroxyl-functional oxetane compound, as disclosed by Steinmann, to the composition of Ohkuma/Date in order to obtain a composition with exceptionally high photo speed, low viscosity, low humidity sensitivity, and high temperature resistance since such properties are taught by Steinmann. Applicants respectfully traverse this rejection as follows.

As explained above, even the proposed combination of Ohkuma and Date would not teach or suggest all of the elements of the independent claim, and the proposed combination with Steinmann would not cure such a deficiency. Accordingly, reconsideration and withdrawal of the §103(a) rejection based on Ohkuma in view of Date and Steinmann are respectfully requested

In view of the preceding Remarks, it is respectfully submitted that the pending claims are patentably distinct from the prior art of record and in condition for allowance. A Notice of Allowance is respectfully requested.

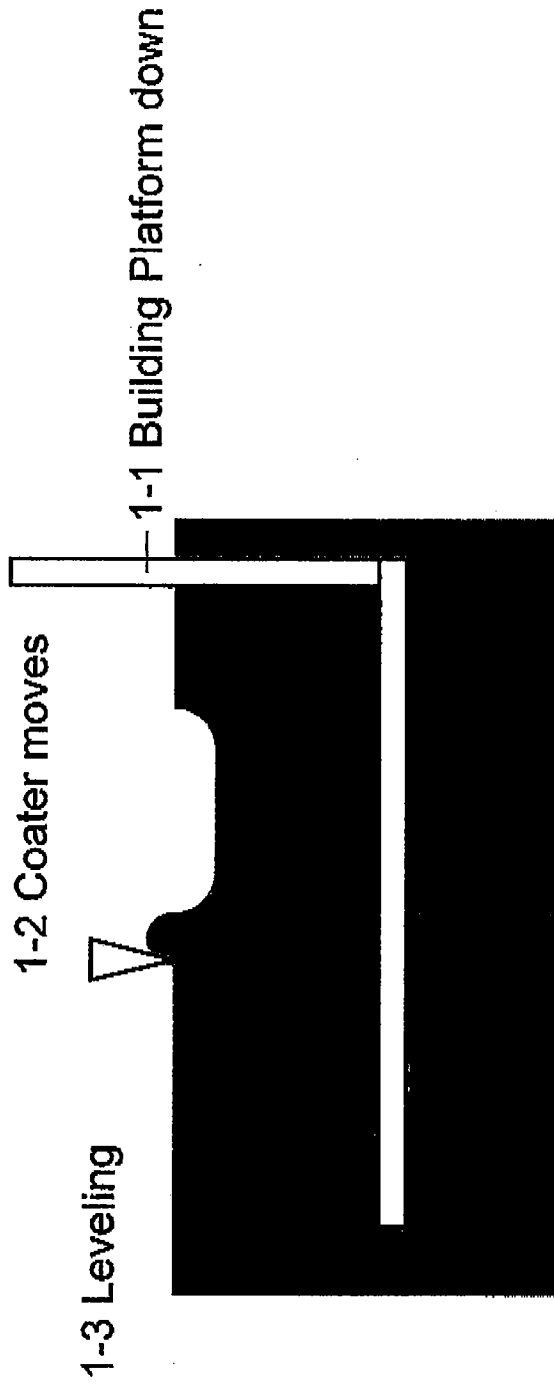
Respectfully submitted,
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Enclosure: Petition for Extension of Time (two-months)
 Diagrams Illustrating Stereolithographic Processes (4 pages)

1. Coating

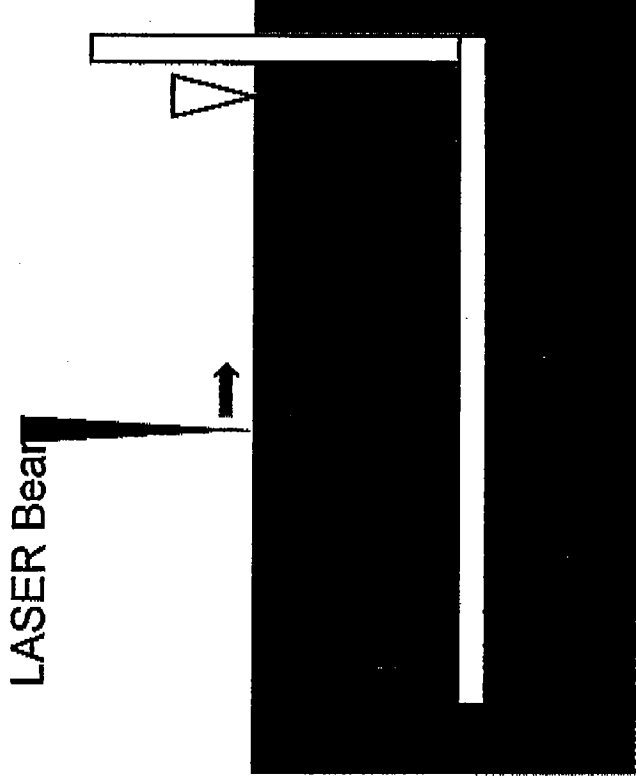


1-1 Building platform descends by layer thickness.

1-2 Coater traverses the vat and forms uncured resin layer.

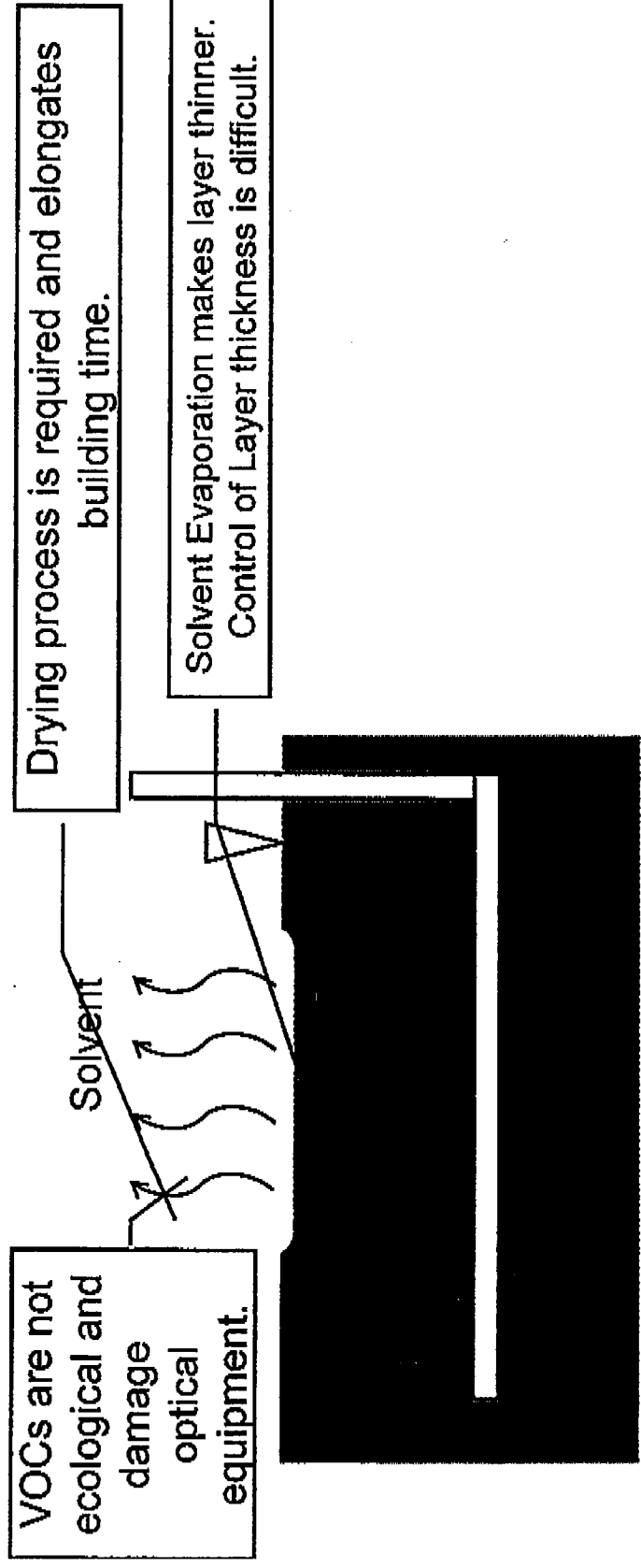
1-3 Resin surface is leveled and layer thickness is adjusted.

2. LASER Drawing



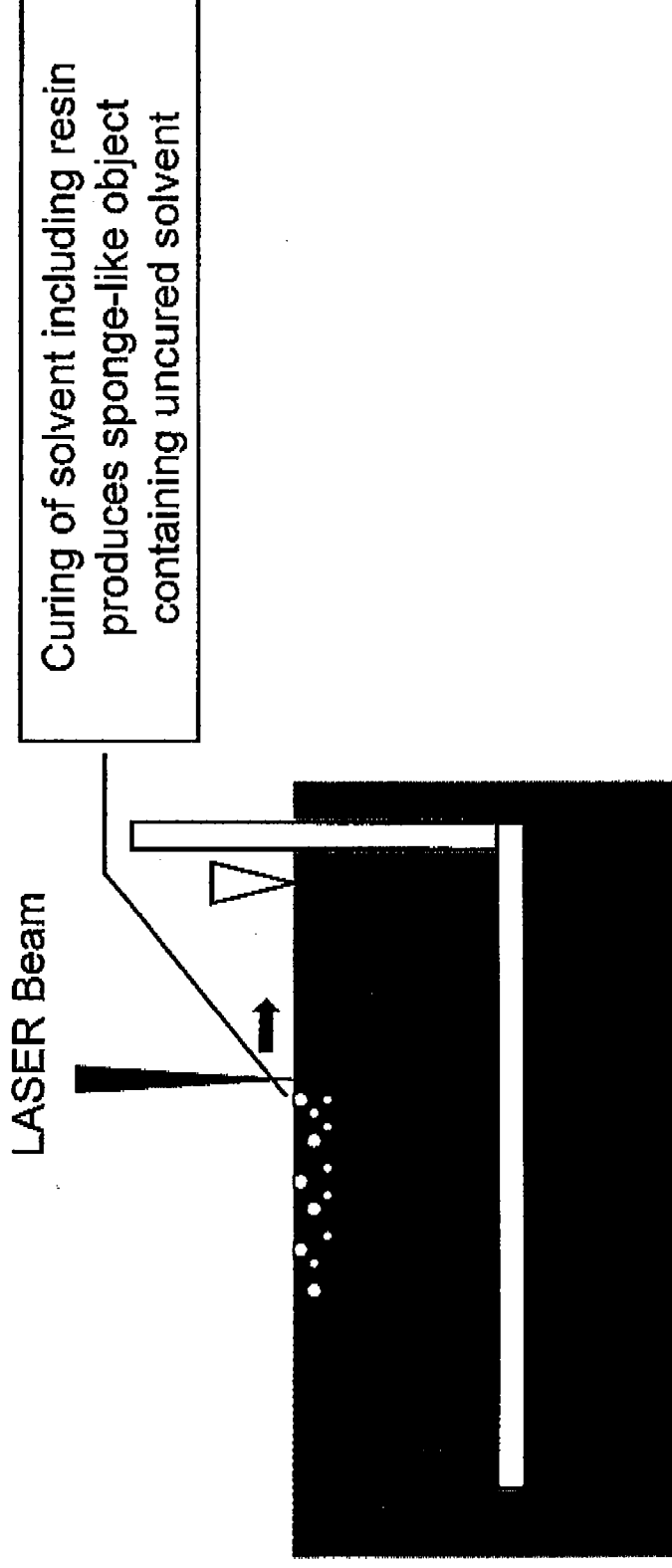
2 LASER Beam moves under the control of computer. After completing LASER drawing, Process No. 1 is repeated.

Solvent Including Situation 1



- Drying process causes many technical problems.

Solvent Including Situation 2



- Omitting drying process leads to weak and unfilled object.